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Rule-Governed Behavior: Unifying Radical and Paradigmatic Behaviorism

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Commonalities and differences between Skinner's analysis of verbal behavior and the paradigmatic behaviorism (PB) approach are described as a means of introducing the latter to behavior analysis. The focus is on treating the topic of rule-governed behavior—a topic of current interest in behavior analysis in addressing the challenge of cognitive psychology—within the PB framework. Dealing behaviorally with traditional psychology interests is considered important in PB, and this article aims to advance toward that goal. PB has presented a framework that deals with not only the behavioral description of language but also with language *function* as well as language *acquisition*. This includes a treatment of the manner in which verbal stimuli generally can control motor behavior. This framework includes analyses in addition to those present in the behavior analytic framework, along with empirical developments, and these can be used to enhance a behavioral understanding of important parts of verbal behavior and the effects of verbal stimuli on behavior, including rule-governed phenomena. Our purpose is to use the particular topic of rule-governed behavior to argue that a more explicit interaction between radical and paradigmatic behaviorism would advance behaviorism and also enable it to have a stronger impact upon psychology and the scientific community.

Language is a very central aspect of human behavior. In treating the topic of verbal behavior, Skinner (1957) introduced the analysis of types of verbal behavior as operants. In doing so he described these aspects of language in new behavioral terms in a manner that had great significance and heuristic value. The existence of this Journal, and the behavior analytic studies it publishes, gives abundant evidence of this value. Behaviorism is a tradition with enormous potential for development. Works such as *Verbal Behavior* (Skinner, 1957) are great not only for their own advancements but also because they advance the tradition on a general front and thus open the way for other developments.

The present paper is concerned with describing and elaborating another behavioristic conception of verbal behavior and language. This approach, called paradigmatic behaviorism (PB), utilized Skinner's works in some of its early analyses as well as the works of other behaviorists (Staats, 1957a, 1957b, 1963). Through this, and as a strict behaviorism, PB has much in common with Skinner's radical behaviorism (RB). Since the middle 1950s there has been cross-fertilization in both directions between these approaches (Staats, 1991). But PB has also developed various fundamental differences from RB—in philosophy, in theory, in method, and in empirical works. How PB differs from RB is frequently a question with behavior analysts who are unfamiliar with PB's literature. These differences cannot be dealt with within the scope of the present work (there are available publications, from a variety of sources, that present PB). There are, however, some differences that will be men-

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tioned in the context of the present subject matter for they involve new and significant developments that add to behaviorism's concern with language.

For example, when Skinner composed his *Verbal Behavior* his central task was that of analyzing types of verbal behavior as verbal operants—such as tacts, texts, mands, echoics, and so on. Although principles of acquisition were implied by the analysis, the conditions of training and learning that are involved were not a matter of focal attention. The analysis of those conditions, however, is essential for understanding language development, individual differences in language, and for the measurement and treatment of language problems. PB, with its focus on human learning and child development, concerned itself with language development from the beginning, in conceptual analyses and in experimental and experimental-naturalistic research (e.g., Staats, 1957a, 1957b, 1961, 1963, 1968a, 1971a, 1971b, 1974, 1986; Staats & Burns, 1981; Staats & Butterfield, 1965; Staats & Staats, 1957, 1958; Staats, Staats, & Crawford, 1962; Staats, Staats, Schutz, & Wolf, 1962). Besides providing new findings, this work also led to new conceptual developments about the *repertoires* of language that were being categorized, as will be indicated.

Moreover, as another difference, PB also isolated and defined additional language repertoires to those specified in *Verbal Behavior*. This stemmed in part from the difference in the basic "learning theories" that compose the foundations of the two behaviorisms (see Staats, 1970, 1979). In its "three-function learning theory" PB indicated that stimuli can (1) elicit an emotional response, (2) act as a reinforcing stimulus, and also (3) function as a directive (discriminative) stimulus for approach or avoidance behaviors—and that these three functions are related. The theory, thus, indicated how emotional responding and operant responding, and thus classical and operant conditioning, are intimately interrelated. PB's basic learning theory, hence, led not only to its interest in verbal behavior as an operant, but also to the conceptual and experimental analysis of the *verbal-emotional repertoire*, that is, the category of language behavior that involves the words that elicit an emotional response in the person (Staats & Staats, 1957, 1958). This development, and its basic learning theory, provide the basis for understanding in a much more elaborate manner how language has reinforcing properties for individuals (Finley & Staats, 1967; Harms & Staats, 1978).

In addition, PB has systematically studied how classes of words (verbs, adverbs, adjectives, and nouns), individually and in combinations, come as stimuli to control specific motor behaviors (Staats, 1963, 1968a; Staats, Brewer, & Gross, 1970). Moreover, PB introduced and studied how the emotion-eliciting properties of language can be important in the behavior-controlling powers of language (Staats & Burns, 1982; Staats, Gross, Guay, & Carlson, 1973; Staats & Warren, 1974). Language is centrally important as a means of changing human behavior, and it is important in behaviorism to deal with such phenomena (Staats, 1972).

Besides adding the necessary interest in the study of the acquisition phases of language behavior, PB first stated the general need for the systematic study of the *functions* of language in behaviorism (Staats, 1963, chap. 5). Some of the functions were noted above such as the ability of verbal stimuli to elicit emotional responses, to serve as reinforcing stimuli, and to control motor behavior in different ways. PB originally considered reasoning and problem solving as labels (tacts) to the problem solving situation (Staats, 1957b), strings of word association sequences (intraverbals), and the verbal-motor control of problem solving behaviors (Staats, 1963, chap. 5, 1964b, 1966). The present paper will exemplify some of these principles in our analysis of rule-governed behavior. The general point, however, is that a behavioristic approach must be concerned not only with behaviorally defining verbal behavior, but also with explicating how verbal behavior is acquired and what its functions are once

it is acquired—both its interpersonal functions and its intrapersonal functions.

Let us mention one final point of difference. Probably because Skinner's major work came at such an early time, or perhaps because his experimental analysis of behavior was such an important methodological development, Skinner (1957) did not suggest research methods for studying verbal behavior (with the exception of one mention of the verbal summator). For example, various behavior analysts have noted the lack of empirical research stemming from *Verbal Behavior* (e.g., McPherson, Bonem, Green, & Osborne, 1984). With respect to PB's inception, the major research methods for studying animal behavior principles already existed. PB thereby concentrated its efforts on developing methods for the study of complex human learning (Staats, 1964a, 1977) and was thus distinctive in beginning its study of language as an empirical endeavor in the early 1950s. In its systematic development various methods were adapted and developed, and in the process PB developed different general methodological characteristics than RB. Some of these elements have already found their way into behavior analysis, and there are others which would also be advantageous. One purpose of the present paper is to suggest that an increased interaction between RB and PB would be valuable to the growth of behaviorism.

THE CONCEPT OF RULE-GOVERNED BEHAVIOR

Among the contributions in Skinner's approach to verbal behavior is the interest that his analysis of rule-governed behavior (Skinner, 1966, 1989) is currently generating in RB (Blakely & Schlinger, 1987; Brownstein & Shull, 1985; Hayes, 1986, 1989; Hineline & Wanchisen, 1989; Parrott, 1987; Schlinger & Blakely, 1987; Vaughan, 1987). To quote from a article by Vaughan (1987):

> rule governed behavior is emerging as a critical class of behavior in analyzing complex human behavior. The descriptive power of the concept is especially revealing (and appealing) when one is analyzing some of the activity referred to by cognitive psychologists as higher mental processes . . . Skinnerian psychologists have [thus] begun to study cognitive activity. (pp. 258, 263)

This interest involves both basic research (Bentall & Lowe, 1987; Catania, Matthews, & Shimoff, 1982; Galizio, 1979; Hayes, et al., 1986; Hayes, Thompson, & Hayes, 1989; Shimoff, Matthews, & Catania, 1986) as well as the use of the rule-governed behavior concept to analyze aspects of psychopathology, psychotherapy and cultural anthropology (Glenn, 1983; Hamilton, 1988; Hayes, Kohlenberg, & Melancon, 1989; Malott, 1988; Poppen, 1989; Zettle & Hayes 1982, 1986).

The historical basis for this interest was Skinner's (1966) distinction between behavior determined by its consequences and behavior determined by rules. Skinner defined a rule as a contingency-specifying stimulus. Rule-governed behavior, in turn, is the behavior under the control of the rule. For example, a parent says to their adolescent on Monday morning "If you mow the grass this week, then you can go camping with your friends on the weekend." This verbalization is a statement that specifies for the adolescent a behavior and reinforcing contingency. When the statement has the effect of increasing the probability of the behavior this is considered rule-governed behavior.

The current concept of rule-governed behavior has evolved from Skinner's original treatment and there is debate within RB on the exact nature and function of rules (Blakely & Schlinger, 1987; Brownstein & Shull, 1985; Catania, 1989; Glenn, 1987, 1989; Hayes, 1986; Hayes & Hayes, 1989; Parrott, 1987; Schlinger, 1990; Schlinger & Blakely, 1987; Vargas, 1988; Vaughan, 1987, 1989). For example, one point of debate is whether rules should be considered as only discriminative stimuli or should be treated as function-altering stimuli and, perhaps even more interesting, the degree to which the understanding of the function of rules requires an introduction of internal events with causal properties (Malott, 1988; Parrott, 1987; Vaughan, 1987). For example, Vaughan (1987) criticizes Parrott's (1987) analysis of

rule-governed behavior for its deviation from a strict Skinnerian analysis.

> I am not sympathetic with Parrott's description of the necessary organismic history from which she asserts rule following emerges. I do not believe that an appeal to private events brings us any closer to predicting or controlling behavior. (Vaughan, 1987, p. 278)

A requirement of behaviorism is precision of statement and empirical definition. Such precision demands analysis, that is, breaking complex events down into their constituents. The present controversy over the concept of rule-governed behavior indicates that it has not been broken down analytically and that it includes various things that are not specified, and that it is thus vague. As a consequence it has been adapted in considering different things, and now it has been given different characteristics and definitions. Because of this, the concept may be likened to the social learning theory concept of "modeling," which is used to label a number of phenomena—ranging from reading to following instructions to imitation. When one concept is stretched to consider phenomena with different characteristics, the concept becomes mushy and indefinite. When phenomena are different, each requires separate and distinct empirical stipulation and analysis. In general, working within behaviorism requires precise conceptual as well as empirical definition.

The present paper will thus not attempt to provide the definition of rule-governed behavior, because *one* would not suffice. Rather, we will suggest that what is called rule-governed behavior actually involves different types of *repertoires*, repertoires which another behavioral approach, PB, has analyzed individually, some under the consideration of *language acquisition* and others in considering the *functions of language*. Some of the concepts and principles involved in this development will be summarized.

THE BASIC BEHAVIORAL REPERTOIRES AND LANGUAGE BEHAVIOR

The term repertoire is frequently used in behaviorism, and RB also uses the term response class (see Evans, Meyer, Kurkjian, & Kishi, 1988, for a review of such terms). Skinner originally defined the response class as the class of responses under the same reinforcement contingency. The term repertoire, however, has never been systematically defined. The tendency is to use such terms freely, as something generally understood, without the necessity for formal consideration. PB, however, takes the position that the term repertoire constitutes a basic concept that is central in theory and research construction. (An early project involved the definition of the verbal response class, see Staats, Staats, & Finley, 1966; Staats, Staats, & Minke, 1966). This position grew out of PB's systematic research in three areas—on language behavior, emotions, and sensory-motor behavior. Progressively it became apparent that three very general, very complex behavioral systems, called basic behavioral repertoires (BBR), were involved. Much of PB's research consists of the specification and study of the acquisition and function, and thereby definition, of these basic behavioral repertoires (e.g., Staats, 1968a, 1971a, 1975; Staats et al., 1970; Staats & Burns, 1981; Staats & Eifert, 1990). To illustrate, the specification of a BBR includes:

> (1) the constellation or population of behaviors making up the BBR; (2) the specific learning conditions necessary to establish the BBR; (3) the importance of the elements in the BBR as prerequisites for the acquisition of additional skills within and across BBRs; (4) how the BBR and the situation exert a joint influence in producing behavior; and (5) how the BBR will reciprocally interact with the environment to determine subsequent learning (i.e., the elaboration of the BBR and the establishment of new BBRs) as well as the behavior of the individual in later situations . . . (Burns, 1990, p. 104).

The repertoires are called *basic behavioral repertoires* because they help determine the individual's learning, as well as the manner in which the individual behaves, in life situations. With respect to learning, when a child faces a learning task in school, for example, the outcome is a function not only of the reinforcement conditions of the situation, according to the principles of reinforcement, but also of the repertoires the child "brings" to the situation. Explanation of the child's behavior and learning (achievement) depends in part on

specification of the presence or absence of certain basic behavioral repertoires (Staats et al., 1970; Staats & Burns, 1981). Our focus here will be on how the individual's basic behavioral repertoires constitute a determinant of the individual's behavior in life situations. We cannot do this exhaustively, but some of the language BBRs important with respect to rule-governed behavior will be described.

THE VERBAL-MOTOR AND LABELING REPERTOIRES AND THE DIRECTIVE FUNCTIONS OF LANGUAGE STIMULI

One of the BBRs is called the *verbal-motor repertoire*, that is, the words that will elicit (control) particular motor responses. The analysis of acquisition recounts how, through operant discrimination training, the child learns this large repertoire of individual words as directive (discriminative) stimuli. Most of the *verbs* in our language—for example, the words run, jump, take, lift, give, examine, inspect, observe and so on—become directive (discriminative) stimuli in this manner. There are also other words—such as nouns, adjectives, and adverbs—that we have learned to respond to motorically through the same type of conditioning. The child, to illustrate, may be told "Give me the pliers," along with a gesture indicating the tool is on a table. The child may try different objects while the adult guides the behavior by saying "No, pliers!" until the child picks up the pliers at which time the adult says "Yes, pliers," and the child hands it over. In the process the child is learning a labeling response (called a tact by Skinner, 1957, without the acquisition and function analysis) as well as a verbal-motor response element. The "ability" to follow instructions thus depends upon the individual having large numbers of these elements, that is, a verbal-labeling repertoire and a verbal-motor repertoire. These repertoires are not empty or vague concepts in PB; they have been systematically specified empirically and conceptually. Let us begin with the verbal-motor repertoire.

PB began its study of language behavior with an experimental-naturalistic study that involved reinforcing a pet cat for approach behavior when its name was called—wherever the caller was located. The cat was trained to other verbal-motor units such as "sit" and "shake" as well. Not publishable in 1954, because of its methodology, the study was used didactically (with fellow graduate students, including Jack Michael), in conceptual formulations (see Staats, 1963, 1968a), and served as the basis for later experimental-naturalistic and formal research. As examples, research was done in training infants in early language development (see Staats, 1968a) and pre-school children in letter writing motor responses under the control of the names of letters and in counting where the number-words came to control the motor response (see Staats et al., 1970; Staats & Burns, 1981). Much of this involved experimental-longitudinal research where children were worked with over long periods in which many verbal-motor elements were produced through training.

Others have also extended this research (Leduc, 1988). For example, Herry (1984) showed how mentally retarded children can be trained to respond with their left hand to the word "left" and to the right hand with the word "right," yielding important verbal-motor units that define the "concept" of left-right. Lee (1981) supported these results in a study involving reinforcing children for making particular motor responses to more complex instructions and stimuli. Interestingly, although Lee used the concept of the verbal-motor repertoire and training to produce verbal-motor units, these were taken for granted and not focally considered, in favor of pursuing a theoretical hypothesis where the training was compared to another type of training. Nevertheless, demonstration that verbal-motor units could be trained provided additional support for PB's concept and analysis. There is thus an extensive empirical basis for the PB concept that the child learns to respond to a large number of *verbs*, *nouns*, *adjectives*, and *adverbs* each of which as a stimulus lend control to particular motor responses and to what stim-

uli the responses are made to. This very large repertoire is a basis for following instructions. Sometimes the single words suffice, as in the command "Jump!" and sometimes more complex combinations are involved, as will be indicated. In any event, the single word verbal-motor repertoire that is basic can vary in size and quality among individuals.

To continue, one of the categories of verbal behavior defined by Skinner (1957) was the tact. PB always required that the theoretical behavior analyses it has made or adopted be stated in a manner that permits empirical specification. Thus, early in its development PB conducted experimental-longitudinal research that involved training pre-verbal infants to what was called a labeling (tacting) repertoire, as described in several books (see Staats, 1963, 1968a, 1971a). These findings were used in later studies in which children were trained to label objects, colors of objects, numbers of objects, labels of printed letters and words (the latter called texts by Skinner), and so on (Staats, 1968a; Staats, et al., 1970; Staats & Burns, 1981; Staats, Finley, Minke, Wolf, & Brooks, 1964; Staats, Staats, Schutz, & Wolf, 1962). In one specific study, Paul Ban and Karl Minke worked individually with a child of four who had never learned speech due to a badly cleft palate. Following surgical repair of the palate, PB's token reinforcement apparatus designed for work with young children was used to train the child to a repertoire of phoneme speech responses (Staats, Minke, & Ban, 1984). The child's repertoire learning was recorded such that the child's learning could be seen in detail. In summary, the position is that the child, through operant discrimination training, learns a very large number of *noun, adjective,* and *adverb* labels.

These basic language repertoires that the child learns constitute the elements by which the child can follow instructions. The basic repertoires can be "put together" in a huge number of ways, called out by the large number of new combinations of environmental stimuli that occur. (This is an important principle in and of itself.) The extensiveness and complexity of the instructions the child can follow depends on the nature of the repertoires that have been learned (Staats & Burns, 1981). For example, the instruction "Press the red button" involves complex verbal stimulus control. The total instruction serves as the stimulus that controls the response of looking for a type of object. The word "press" elicits the specific response, that of pressing something. If there are variously colored buttons present, the total instruction controls scanning them until one button elicits the words "red" and "button" as labels, and those labels provide the stimuli determining to what specific objects the response will be made to. A more complex verbal instruction—for example, to "press rapidly on the red button when the green light is on and to press slowly on the red button when the yellow light is on" requires an additional repertoire involving what we call *adverbs.*

Rule-governed behavior, where the instructions actually state a contingency, is only a small percentage of instruction following behavior, and even then it is not the reinforcement specified by the contingency (which may or may not occur) that determines the behavior, as will be explained in the next section. Primarily, the control of behavior depends on BBRs of the type described. The statement of contingency does occur in language, however, and it does have additional controlling power. But that is only a description, not an explanation, as we can see when such statements do not always control appropriate behavior (as any parent knows). To be able to state explicitly what is involved, and to be able to use that in predicting and controlling behavior, we need to examine more closely these phenomena and especially the specific repertoires involved, the focus of the next two sections.

RULE-GOVERNED BEHAVIOR AND THE LANGUAGE REPERTOIRES

In the PB approach to language, it is necessary to be analytic in specifying the language repertoires, the principles *and conditions* involved in their acquisition, and the

powerful functions of the repertoires. These qualities are important in making the approach heuristic. As an example of the difference that a fine-grain analysis produces, let us consider the original definition of rule-governed behavior as a verbal stimulus that states a contingency—"If you do this, then you will get this"—thus having an effect on behavior similar to a nonverbal stimulus in the presence of which the behavior has been reinforced, that is the actual contingency. The reason why transfer occurs to the verbal stimuli is ordinarily left vague, but the definition may be elaborated by saying that such phenomena can be explained as discriminative control involving a past history of being reinforced for responding when such contingency statements have been issued, with the control maintained by the fact that the individual in responding as directed in the rule continues to be reinforced (positively or negatively). But most or many statements to which humans respond to state no contingency—for example, the poster stating "Come to the Young Socialists meeting," or a set of instructions for putting together a model airplane or making a particular golf swing. There are also many one and two word instructions that control behavior, like "Look out," "Jump," "Sit down," and the like. The fact is, many times the individual has never before experienced the particular verbal instruction involved, and thus could not have learned to respond to it as a discriminative stimulus. To rebut this it might be said that what the individual learns is to respond generally to contingency statements. But then we cannot account for the fact that the individual only responds to some contingency statements, and to many non-contingency statements. We need to be able to understand such complex behavioral events, and the concept of rule-governed behavior is not refined enough to do so.

A better statement of the principles is required to account for such phenomena. What the child learns are repertoires of verbal-motor and verbal-labeling units. Combinations of those units can be put together in all kinds of ways. And they control combinations of behaviors to combinations of stimuli, even the first time they occur, without there ever having been reinforcement in the past for that particular combination of stimulus or response events. The basic language repertoires constitute the explanatory mechanisms. Once they are acquired they operate. The behaviors involved do not require immediate or specific reinforcement—only general reinforcement that maintains the individual's general language behaviors. Although the principle involved in the first learning of the *verbal-motor repertoire* (to verbs, nouns, adjectives, and adverbs) is that of reinforcement, after the *repertoire* is well learned the principle of reinforcement does not have to be involved proximally or specifically (see Staats, 1968a). For example, the choreographer or coach may never deliver positive reinforcement, only criticism. Sometimes verbal instructions that are followed even lead to aversive stimuli. The behavior does or does not occur because of these contingencies. In the example, the dancer's or athlete's *novel* behavior is controlled by the verbal stimuli because the dancer has a well acquired, complex verbal-motor repertoire that is called forth by the choreographer's *novel* instructions. The strength of behavior under verbal stimulus control is not maintained by the fact that verbal statements describe contingencies wherein the particular response is followed by the specific reinforcer. Reinforcement remains important only in the general way that verbal commerce between people has reinforcing consequences.

The many variations in the extent to which different individuals respond to verbal statements must be explained by means of something other than rule-stated contingencies, for the same contingencies are there for everyone. Thus, when a teacher tells a class to open their workbooks to a particular page and to do certain things, the same contingencies are there for all the students, but only some of them respond. Moreover, the situation may be reversed when the children go to gym class and the coach gives instructions to do a certain

number of push-ups. A more complete set of principles and concepts is necessary to account for the individual-difference phenomena at hand. In the present example, children respond differently to instructions because they have learned different basic behavioral repertoires in language (i.e., different repertoires in terms of the elements in the repertoires). What is called *comprehension* depends in good part on the verbal-motor BBR.

Another indication that it is necessary to expand the rule-governed conception can be seen in the fact that new elements in the language repertoires can be learned without the reinforcement conditions of operant conditioning. For example, the child can learn to respond to a new verb simply by having it paired with a verb that is already a *verbal-motor unit*. Support for this was originally given by telling a young child "Wug means close" several times (with no reinforcement). She already had learned the words "close" and "the door" in her *verbal-motor repertoire*. That is, told to "Close the door," she would do so. The important finding was that the nonsense word "wug" had acquired verbal-motor control; later when the child was told "Wug the door," the instruction controlled the appropriate response (Staats, 1966, p. 267). Simply pairing "Wug" with "Close" had the effect of making "Wug" into a verbal-motor unit—a verbal directive stimulus that had control over a particular class of motor behaviors. The principle is that once the *verbal-motor repertoire* is established, it functions as a basis for new learning. Just through pairing one verbal-motor stimulus with a new stimulus, the new stimulus becomes a verbal-motor stimulus. Most of our verbal-motor (and other) language repertoires are established through pure language experience (see Staats, 1968a).

The above principle, where control of behavior is transferred from one verbal stimulus to another through pairing, is another difference between PB and RB. The PB principle is called "higher-order operant (or instrumental) conditioning" and is involved in important human learning. Support for the principle comes from research in addition to the experimental-naturalistic finding described above. That is, with mentally retarded children Herry (1984) first made sure his subjects had the basic verbal-motor units by telling them "Show your hand for eating" and "Show your other hand" and seeing if they responded appropriately. He also ascertained that these children did not have the "concepts" of *right* and *left*, that is, they could not respond to instructions to "Show your left hand" and "Show your right hand." Herry then individually trained the children using a higher-order conditioning treatment. His procedure involved learning trials wherein the child was told to "Show the right hand for eating" and "Show the left hand, the other hand." (The procedure was reversed for left-handed children.) The children first needed the verbal stimuli of "showing the hand for eating." Following this training, trials were conducted where each child was instructed to "Show the right hand" or "Show the left hand." The results showed that the higher-order instrumental conditioning had successfully turned the words "right hand" and "left hand" into verbal-motor stimuli, a type of "concept" that retarded children usually have difficulty learning.

Let us thus add that the concepts of the *verbal-motor* and *verbal-labeling repertoires* as mechanisms for directing behavior are more general, in various ways, than the concept rule-governed behavior. It is also of some significance, with respect to indicating differences in the behaviorisms, to indicate that the PB analysis of language (Staats, 1963, chap. 4 & 5) began earlier than the rule-governed analysis and has incorporated various types of behavioral research that has not been considered in the rule-governed statements. In addition, as has been indicated, many language stimuli that direct human behavior do not specify contingencies and, even in cases where contingencies are indicated, it is still necessary to account for *why* the individual does or

does not respond appropriately, a task we will turn to now.

THE VERBAL-EMOTIONAL REPERTOIRE AND "RULE-GOVERNED" PHENOMENA

For this, we must introduce additional aspects of the PB theory of the language-repertoires, that is, the verbal-emotional, the verbal-reinforcer, and the verbal-directive repertoires. To begin, Hayes and colleagues recently introduced the concept of emotions to Skinner's treatment of rule-governed behavior (Hayes, Zettle, & Rosenfarb, 1989; Zettle & Hayes, 1982), using the "establishing stimulus" terminology (Michael, 1982). For this purpose they defined the concept of "augmenting" as "rule-governed behavior under the control of apparent changes in the capacity of events to function as reinforcers or punishers" (Zettle & Hayes, 1982, p. 81). They then further define their concept by reference to Skinner's autoclitic concept, which they in turn state rests upon "the ability of words to elicit conditioned emotional responses" (p. 81), although this is not in the original. They continue by adding a principle that connects reinforcement and emotions by saying that words, as in a poem, may elicit an emotional response that may alter one's capacity "to find particular events reinforcing or punishing" (Zettle & Hayes, 1982, p. 81). As another example they describe a radio commercial in which a Burger King hamburger is described as "a plump, juicy hamburger, hot off the grill" and go on to indicate "a good commercial will literally make your mouth water" (Hayes et al., 1989, p. 207-208).

This analysis actually does not derive from Skinner's statements. Moreover, it is much less developed theoretically and experimentally than the corresponding elements in PB. In restricting their analysis to Skinner's (1957) statement Hayes and colleagues short change the ability of behavioral psychology to deal with the phenomena involved. Skinner (1957) did briefly describe that words can elicit emotional responses through classical conditioning. But this was a bare mention, not set into the relevant literature, not developed in the various ways necessary in order to provide the important analysis of language and language phenomena that are necessary. This is understandable because not everything can be treated in the first attack on a complex subject matter. It is also understandable because Skinner's (1938, 1957) basic learning theory takes the position that respondent conditioning and operant conditioning are separate and independent. Since this theory pointedly states that emotions do not affect behavior (Skinner, 1975), respondent conditioning has not been studied much in behavior analysis, and that includes the various ways that emotional conditioning occurs with humans, or the manner in which emotions affect human behavior.

One of the primary differences of PB from Skinner's basic theory concerns the relationships of classical (respondent) and operant (instrumental) conditioning. Since differences in basic theory are involved here, different implications follow for every area of study involved, including language behavior. In PB's basic theory stimuli that elicit emotional responses are consequently reinforcing stimuli. As emotion-eliciting value of a stimulus is changed, through some form of respondent conditioning, or through deprivation-satiation manipulations, reinforcement value is changed. Moreover, the manipulation of emotion-eliciting value will also change the directive (discriminative) control of the stimulus as well. That is, the organism learns to approach stimuli that elicit a positive emotional response (because those stimuli are also positive reinforcers) and to escape from and avoid stimuli that elicit a negative emotional response (because those stimuli are also negative reinforcers). (These two principles constitute a large change in basic theory, but they are based in experimentation, for example, Finley & Staats, 1967; Harms & Staats, 1978; Staats & Burns, 1982; Staats & Hammond, 1972; Staats & Warren, 1974; see also Staats, 1970, 1991). Following its basic theory, PB has systematically pur-

sued the study of classical conditioning of emotions, the ways in which emotions are conditioned in humans (most importantly how this occurs through language experience), and how the human's "emotional repertoire" affects behavior, all topics to be added to the knowledge corpus of behavior analysis (Staats & Eifert, 1990).

The important point here is that PB has studied emotions in language, has a very large experimental literature, and a systematically developed set of principles. Those in the field of rule-governed behavior who are introducing emotions to their conceptual analyses do not have such developments and need them. It is thus important to bring the behavior analytic interest in rule-governed behavior into conjunction with the PB developments. While this cannot be done exhaustively here, it can be indicated that in the same year *Verbal Behavior* was published, a study was published in the *Journal of Experimental Psychology* which dealt with the manner in which words elicit emotional responses (Staats & Staats, 1957; see also Staats & Staats, 1958, 1959; Staats, Staats, & Biggs, 1958; Staats, Staats, Finley, & Minke, 1963; Staats, Staats, & Heard, 1959; Staats, Staats, & Heard, 1960, 1961; Staats, Staats, Heard, & Nims, 1961). Moreover, the study showed how words acquire that property of eliciting emotional responses. That is, the study demonstrated higher-order classical conditioning—in which words which had become conditioned stimuli for an emotional response, would transfer this property to other stimuli with which they were paired. This is a central principle for understanding how language functions in determining human behavior. This study, and the language conditioning methods employed have been replicated in a large number of studies (see, for example, Berkowitz & Knurek, 1969; Early, 1968; Hekmat, 1973; Hekmat & Vanian, 1971; Tryon & Briones, 1985). In addition, another study was conducted (Staats, Staats, & Crawford, 1962) that demonstrated how words come to elicit emotional responses on the basis of primary classical conditioning. This study was replicated several times (e.g., Maltzman, Raskin, Gould, & Johnson, 1965; Zanna, Kiesler, & Pilkonis, 1970). These experiments indicate how the individual first learns the repertoire of emotion-eliciting words from which a larger repertoire is learned on the basis of higher-order conditioning. Within these principles lies the explanation of what are referred to in traditional psychology as attitudes, values, interests, and preferences (Lohr & Staats, 1973; Staats, 1968b, 1983b; Staats, Gross, et al., 1973), important topics in social psychology.

Hayes et al. (1989) also briefly mention that a relationship exists between the emotional properties of a word stimulus and its reinforcing properties and between deprivation-satiation manipulations and the strength of the emotional properties of a word stimulus and hence its reinforcing properties, albeit not in a very clear manner. No empirical evidence was adduced in support of these principles and they are not consistent with the basic theory on which their position is based (Skinner, 1938, 1975). However, the principles are the same as those in PB's basic theory as described above, principles that have been systematically derived and stipulated. Moreover, PB has systematically and fully demonstrated the principles experimentally, using word stimuli. For example, it has been shown that the emotion-eliciting (salivation-eliciting) value of food words is increased by deprivation operations (Staats & Hammond, 1972) as is the reinforcement value of the words (Harms & Staats, 1978), and the ability of the words to produce higher-order conditioning (Staats, Minke, Martin, & Higa, 1973).

The PB basic principles also state that stimuli that elicit positive emotional responses will control approach responses and stimuli that elicit negative emotional responses will control escape and avoidance behaviors. These principles should apply to emotion-eliciting words, explaining how words can exert control over approach and avoidance behavior, one of the very important functions of language. PB has demonstrated these principles experimentally, in tightly controlled stud-

ies. For example, in one study human subjects deprived of food had stronger approach response tendencies to food words than non-deprived subjects, and deprived subjects avoided food words less strongly than non-deprived subjects (Staats & Warren, 1974). Staats and Burns (1982) showed that these behavior-controlling properties of emotion-eliciting words explain what would be termed values in traditional psychology and the same has been done with the concept of interests (Staats, Gross, et al., 1973). This indicates that with such behavior principles it is possible to go into traditional areas of psychology and replace mentalistic concepts with objective, deterministic analyses, as has been the traditional goal of behaviorism (see also Eifert, 1987, 1990; Hekmat, 1972, 1973, 1987, 1990; Lohr & Hamberger, 1990; Parish & Fleetwood, 1975).

Current behavior analytic references to the role of emotions in rule-governed behavior (e.g., Zettle & Hayes, 1982; Hayes et al., 1989) do not coincide with Skinner's basic principles or his definition of rule-governed behavior. Moreover, they lack empirical support. The same evaluation pertains to the analysis made by Schlinger and Blakely (1987), which is more explicit and more like the PB but, without utilizing PB's empirical foundation, totally lacks empirical support. This, as will be indicated, is the disadvantage of having separate behaviorisms, where developments relevant to each other are not known or used. Now that behavior analysis is becoming interested in such matters as rule-governed behavior, it is time to utilize the existing PB literature. This offers more complete principles and analyses, new behavioral methodology, and new directions to pursue in research for those radical behaviorists interested in the rule-governed behavior area and other areas of verbal behavior and language.

In summary, the present position is that the statement of a contingency rule actually involves the principles introduced and experimentally verified in PB. Take, for example, the statement "If you take the buddha position and continue to repeat a mantra you will feel a high." For that to produce rule-governed behavior, the hearer must have the verbal-motor and verbal-labeling repertoires involving such things as the appropriate responses to "taking the buddha position" and "repeating a mantra." In addition, however, the action will not occur unless these words and especially "you will feel a high" also elicit a positive emotional response that contributes to the control of the behavior. We could have people rate the words "feeling a high" on a pleasant-unpleasant scale and find that some people would rate the words negatively. It has been shown that subjects can accurately rate their conditioned emotional responses (Maltzman, et al. 1965; Staats, et al., 1962; Zanna et al., 1970). The people with the negative emotional response to the words would not perform the behavior. The contingency the words state is thus not the controlling variable for performance of the behavior, in any case, because the contingency only occurs after the behavior. It is the emotion-eliciting effect of the words that is operational. And this is the case for statements that do not explicate contingencies. Thus, the poster stating "Come to the Young Socialists meeting" will differentially control behavior to the extent it differentially elicits an emotional response in the individual and thus differentially controls approach or avoidance behavior. (If the reader has questions concerning the conception of emotions, see Staats & Eifert, 1990.)

GRAMMATICAL RULES

We will conclude with one final example—the topic of grammatical rules. Skinner's *Verbal Behavior* (1957, chap. 13) does provide important comments on grammatical rules. PB, however, provided a more elaborate learning analysis of the acquisition of grammatical rules. Moreover, the PB account was done in the specificity the approach demands, the specificity that is needed for the conduct of research (Staats, 1963, pp. 169-179, 1971b). For example, an early PB analysis (Staats, 1963, pp. 177-178) provided a theoretical

treatment of how children learn plural morphemes (i.e., the use of either the voiced or voiceless sibilant in the formation of plurals). This analysis occurred after Chomsky's (1959) critical article, at a time when psycholinguists felt that learning theory was irrelevant to understanding grammar (Slobin, 1971). Clear experimental support for the PB analysis was subsequently provided in a series of studies by Guess and Sailor (Guess, 1969; Guess, Sailor, Rutherford, and Baer, 1968; Sailor, 1971; Sailor & Tamar, 1972).

Another early PB analysis (Staats, 1971b) answered Chomsky's criticism of a behavioral approach to language—unanswered until that time—and included an analysis of language acquisition that rejected Chomsky's psycholinguistic view that language was not learned. One part of the psycholinguistic position cited examples of children saying things like "All-gone shoe." The position was that the parent never says this and thus the utterance could not be *learned* by the child but must develop from the child's mind. The PB account challenged that analysis, saying that the problem with Chomsky's, and the general psycholinguistic, analysis is that it was based on linguistic findings and linguistic methods of research. The methods are based upon adults speaking *to one another*, and the data are thus limited. Observation of adults speaking to children easily reveals that the adults then speak differently than they speak to each other. PB said that the parents' speech to the child progresses in complexity and otherwise as the child's language advances. We all learn to speak differently to different audiences. The PB position was that psycholinguists should study actual parent-child language in studying language development. The psycholinguists strongly criticized the PB theory of language (Slobin, 1971; Ervin-Tripp, 1971), but in the four years between receiving and publishing that theory, data on child language they had previously gathered was re-analyzed, and the PB analysis of parent-child language was supported (see Ervin-Tripp, 1971). The PB position when stated in psycholinguistic terms then served as the basis for a new research area on parent-child interactions in language development, which one psycholinguist (Rondal, 1984) later attributed to PB's analysis (see also Whitehurst et al., 1988).

There are many other implications of the PB analysis for the empirical study of language and language behavior. (As a final example, there is PB analysis of stimulus equivalence, see Staats & Burns, 1989). The heuristic possibilities can only be available to behavior analysts if they become familiar with the PB literature.

CONCLUSIONS

PB grew out of the behaviorisms of the "second generation" (Minke, 1987) and it contains much that is common to RB. Since the early 1950s the theory has also contributed many elements to what is considered to be RB. PB—although it has developed methodological, empirical, philosophical, and theoretical characteristics different than those in Skinner's work—has remained a strict behaviorism, with its elements based on observational grounds, in an explicit and precise manner. In addition, PB has maintained the traditional goal of behaviorism, set forth by Watson, of becoming the approach of the science of psychology (Tryon, 1990). Following this goal has led PB to make many analyses of topics in the broad field of psychology, and this process has led to some of its differences from RB. There is nothing actually contradictory in these differences, when considered by the standards of general behaviorism. The differences from some of the characteristics of Skinnerian behaviorism should be considered systematically to establish whether or not they are justified and valuable to RB. These differences, without such analysis, have served as the basis for producing a separation between the behavior analytic and PB bodies of knowledge.

This is widely disadvantageous for behaviorism. There are many productive things in both RB's and PB's theories of verbal behavior and language. PB and the verbal behavior approach after 1957 have

affected one another, and PB recognizes the importance of Skinner's *Verbal Behavior*. On the other side, PB began its experimental work on language several decades earlier than RB and it has a great deal to offer in this area. PB has also analyzed areas of language behavior not touched upon by Skinner and it has a great deal of research in these and other areas, some of which have been noted in this paper. Some of the new interest in rule-governed behavior is just beginning to treat these topics. PB has opened new areas of importance to the development of behaviorism in the past, and it has much to offer for the future. In addition to the topics treated here, PB opened the experimental study of reading, writing and number concept research (Ryback & Staats, 1970; Staats, 1968a; Staats & Butterfield, 1965; Staats, Finley, Minke, & Wolf, 1964; Staats, Minke, Finley, Wolf, & Brooks, 1964; Staats, Minke, Goodwin, & Landeen, 1967; Staats, Staats, Schutz, & Wolf, 1962). There are extended projects now being conducted today by Aimee Leduc and her associates (Leduc, 1984, 1988) and by Leonard Burns and his group (Burns & Kondrick, 1989) that extend this framework conceptually, methodologically and technologically. Other research is currently using PB to analyze learning disabilities (Leduc, 1991), mood disorders (Heiby & Staats, 1985; Rose & Staats, 1988; Staats & Heiby, 1990), and anxiety disorders (Eifert, 1990; Hekmat, 1990; Sternberger & Burns, 1991; Staats & Eifert, 1990), particularly the importance of deficit and inappropriate language repertoires in understanding these disorders (see also Eifert & Evans, 1990, for a more general discussion of this research). Another area involves the use of the theory to integrate personality and behavioral assessment (Burns, 1980, 1990; Fernandez-Ballesteros & Staats, in press; Staats & Fernandez-Ballesteros, 1987). Here, again, this integration is based primarily on the theory's analysis of language acquisition and function.

In conclusion, it is our opinion that it is time to cross-access behavioral work on the basis of relevance, not on the basis of sociological (theoretically partisan) factors. Scientific standards argue that such is important because such is crucial to the advancement of science (Staats, 1983a, 1991). This seems to be of particular importance for behaviorism as it strives to become a framework theory for psychology. Thus, in the interest of producing the strongest behaviorism possible, it is time that the interaction between RB and PB become systematic in utilizing the products of each. There is power in each that is complementary. That demands that behavior analysts begin to acquaint themselves with the PB literature. Our hope is that this paper will facilitate this process.

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